> cell these flattened portions of the system are organized in parallel arrays but in other regions of the cytoplasm the system is represented by finer canalicular or vesicular elements. If the serial micrographs are examined closely instances may be found where discrete elements appearing as cross sections of canaliculi come together progressively into single elements representing either longitudinal sections through canaliculi or, more likely, marginal sections through sinusoids. Also in the same series, sequences are apparent defining arborizations of unit structures. In still other regions of the cytoplasm the only elements evident appear as tiny vesicles or cross sections of canaliculi. Since certain of these can be traced from section to section they are evidently segments of canaliculi. (p. 700)

Porter's claim that the structures apparent in whole tissue-cultured cells were the same as those that could be reconstructed across a series of thin sections of cells *in situ* soon turned contentious. Critics objected that what appeared in tissue-cultured cells was an artifact of the process of growing cells in such an abnormal environment. To address this objection, Palade and Porter (1954) adopted the strategy of preparing thin sections of tissue-cultured cells to see how these would look and compared a series of them to the usual whole mounts of such cells. By demonstrating correspondences, they hoped to legitimate the use of micrographs of whole tissue-cultured cells.

Before presenting their results, they advanced a theoretical claim as to how the sections of tissue-cultured cells should look: "Under such circumstances the endoplasmic reticulum . . . cannot be expected to appear in sections as a network. Occasionally, it could be included in the thickness of a given section, but in the vast majority of sections only profiles of 'vesicles and strands' will be encountered and these will appear as independent structures because their original connections have been severed by the microtome" (p. 664). Palade and Porter presented micrographs of a sectioned chicken monocyte (white blood cell) as well as a whole-mount and sectioned macrophage grown from monocytes in tissue culture to establish the correspondences in appearance between whole mounts and thin slices. They went on to compare whole mounts of cultured cells and thin sections of various mammalian cells fixed *in situ* to make their case (see Figure 6.9).

In a second paper in the series, of which he was the sole author, Palade described the appearance of the endoplasmic reticulum in cells in several tissue types from rats and chickens – epithelial, nervous, mesenchymal, and muscular. One difference Palade observed between cells from living organisms and those from tissue culture is that in cells from living organisms the reticulum runs from the nuclear membrane to the cell membrane. Thus, it occurs in both endoplasm and exoplasm. Noting this and the fact that "the